



The Brocade SilkWorm 3200 line of entry-to-enterprise fabric switches simplifies Storage Area Network (SAN) deployment, enabling cost-effective migration from Direct-Attached Storage (DAS) environments.

## SILKWORM 3200

### Highlights

- Provides a low-cost switch solution for DAS-to-SAN migration, small SAN islands, NAS back ends, the edge of core-to-edge enterprise SANs, and hub/loop switch replacement
- Enables low-cost storage connectivity for server clustering environments
- Helps increase ROI for organizations that need reliable, high-performance SANs to support business applications
- Enables 8-port 1 Gbit/sec and 2 Gbit/sec intelligent switching at an unprecedented price point
- Provides full forward and backward compatibility with other Brocade SilkWorm switches
- Simplifies SAN deployment and administration through embedded Brocade WEB TOOLS management software
- Provides the ability to scale from entry 2-switch fabrics to full-feature enterprise-level capabilities

### EXCELLENT VALUE FOR A VARIETY OF SAN ENVIRONMENTS

The Brocade® SilkWorm® 3200 line of 8-port, 1 Gbit/sec and 2 Gbit/sec auto-sensing entry fabric switches significantly increases performance and functionality for small-to-medium-sized SANs. Based on advanced Brocade third-generation switch ASIC technology, the SilkWorm 3200 line combines over 32 Gbit/sec of aggregate Fibre Channel throughput with advanced new features that greatly enhance the value of a wide range of SAN environments.

Designed for low-cost flexibility, the SilkWorm 3200 line can provide an end-to-end 2 Gbit/sec switch solution that serves a variety of purposes, including:

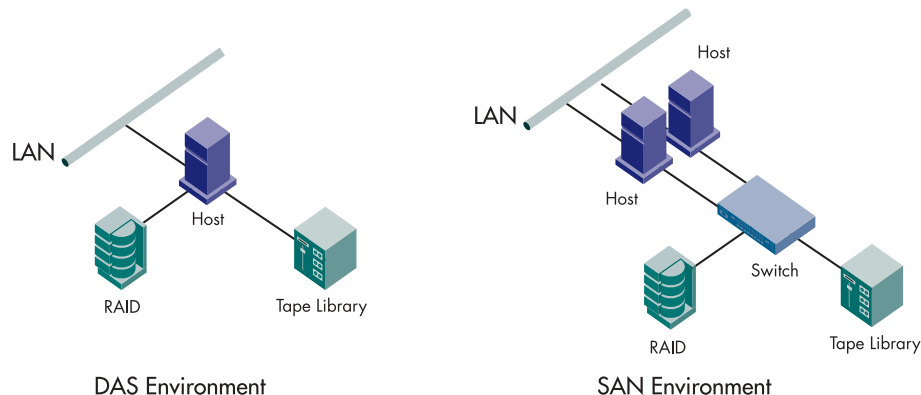
- A fast and easy way to migrate from DAS to SAN environments (see Figure 1)
- A reliable base for small SAN islands and storage fan-out connectivity
- A key component for highly available server clustering environments

- A NAS back end that supports storage consolidation and tape backup for multiple NAS filers
- An entry-point edge switch designed for both entry fabrics and high-performance core-to-edge networks supporting the connectivity of 2 Gbit/sec devices
- A low-cost replacement for legacy hubs and loop switches
- A scalable solution for 2-switch entry fabrics up to full-fabric enterprises

### INCREASED INTELLIGENCE IN THE SWITCH

Brocade has developed an Intelligent Fabric Operating Environment that incorporates intelligence directly into the switch fabric—creating a highly available, scalable, and secure environment for storage applications. This architecture improves performance for SAN applications through the use of advanced fabric services such as optional Brocade Inter-Switch Link (ISL) Trunking and wire-speed Frame Filtering.

**Figure 1.** While DAS environments do not allow storage resource sharing, SANs provide an easy and cost-effective way to share storage—even in multivendor environments.



To support high-speed data traffic, optional ISL Trunking combines up to four ISLs between a pair of switches into a single, logical high-speed trunk running at up to 8 Gbit/sec. In addition, Frame Filtering improves both SAN security and manageability. This intelligent design enables new capabilities such as hardware-enforced zoning based on World-Wide Name (WWN) and advanced performance monitoring to optimize storage resource utilization.

#### HIGH AVAILABILITY THROUGHOUT THE FABRIC

The full-fabric version of the SilkWorm 3200 is designed to provide high-availability switching in redundant dual-fabric SANs for small-to-medium-sized deployments. Combining the proven reliability of the SilkWorm family with a wide range of advanced fabric services, the SilkWorm 3200 line provides a SAN fabric capable of delivering overall system availability greater than 99.999 percent—the “five nines” of availability.

With the Brocade Extended Fabrics feature and Dense Wave Division Multiplexing (DWDM) technology, storage networks can span up to 100 km (1 Gbit/sec) or 50 km (2 Gbit/sec) over Metropolitan Area Networks (MANs)—helping to ensure the highest levels of business continuance.

#### FAST, RELIABLE 2 GBIT/SEC PERFORMANCE

The SilkWorm 3200 line provides excellent price/performance value with all ports capable of operating at 1 and 2 Gbit/sec (full-duplex) to enable 32 Gbit/sec of uncongested switch throughput. Auto-sensing and speed-matching of 1 and 2 Gbit/sec traffic ensures interoperability between current 1 Gbit/sec devices and next-generation 2 Gbit/sec devices.

#### INVESTMENT PROTECTION FOR EXISTING TECHNOLOGY

To help protect existing investments, the SilkWorm 3200 line offers full backward and forward compatibility with other SilkWorm switches—providing a seamless migration path to 2 Gbit/sec connectivity and intelligent fabric services.

Because the new switch supports multivendor SAN environments—such as those built on Windows NT/2000, UNIX, Linux, Solaris, and AIX platforms—organizations migrating from DAS environments have much greater flexibility in building low-cost, easy-to-manage SANs. As a result, these organizations can quickly deploy business continuance applications such as remote, LAN-free, and serverless backup; storage consolidation; remote mirroring; clustering; and data replication.

#### SIMPLIFIED SAN MONITORING AND MANAGEMENT

The SilkWorm 3200 line simplifies SAN management by leveraging Brocade Fabric OS, an embedded real-time operating system. As a result, organizations can easily centralize storage management, automate management tasks, and reduce overall administrative costs. The optional Brocade Fabric Manager provides additional functions for managing multiple SAN fabrics from a single location.

Through optional software such as Brocade Advanced Performance Monitoring, organizations can also improve end-to-end performance analysis by measuring resource utilization on a fabric-wide basis—to quickly identify bottlenecks, optimize fabric configurations, and plan for when additional capacity will be required.

To reduce the complexity of deploying and maintaining multiple Field-Replaceable Units (FRUs), the SilkWorm 3200 is a single FRU that includes redundant cooling fans.

#### A NEW LEVEL OF SAN SECURITY

To ensure that devices can access only their authorized storage resources, optional Brocade Advanced Zoning logically groups a SAN fabric into an unlimited number of secure private SANs (zones).

#### MULTIPLE FABRIC OPTIONS FOR GREATER FLEXIBILITY

To support multiple levels of availability and scalability, the SilkWorm 3200 line includes the option for full-fabric or entry-fabric operation (see Figure 2). All entry-fabric switches can be nondisruptively upgraded to full-fabric switches with a simple software license key upgrade.

#### Full-Fabric Option

The full-fabric switch option is designed for highly available dual-fabric SAN environments as well as for cost-effective core-to-edge SANs (as an edge switch). The full-fabric switch option features a full set of universal ports that enable high scalability and availability in growing SAN environments. Also included are software license keys for Brocade WEB TOOLS, Advanced Zoning, and QuickLoop—as well as the option for Small Form-factor Pluggable (SFP) media.

#### Entry-Fabric Option

The entry-fabric switch option is most suitable for supporting basic SAN connectivity, tape backup for multiple NAS devices, low-cost hub replacement,

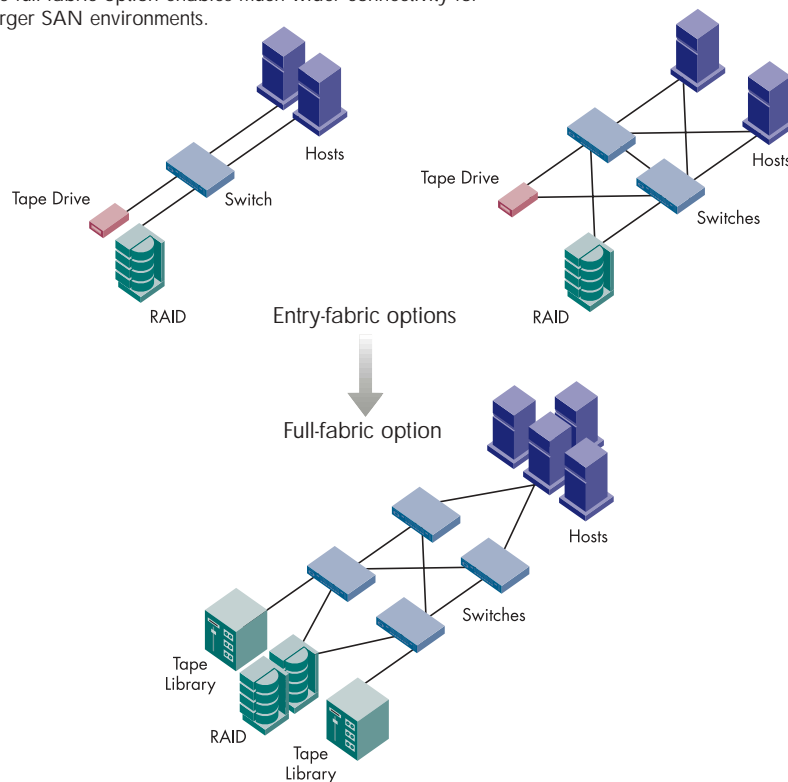
and embedded SAN or NAS applications. The entry-fabric switch option features the ability to build up to a 2-switch fabric. The optional full-fabric license enables fabrics larger than two switches. Also included is a software license key for Brocade WEB TOOLS—as well as the option for SFP media.

#### MAXIMIZING SAN INVESTMENTS

Brocade and its partners offer complete, cost-effective SAN solutions to meet a wide range of technology and business requirements. These solutions include education and training, support, service, and professional services to help optimize SAN investments. For more information, contact an authorized Brocade sales partner or visit [www.brocade.com](http://www.brocade.com).

**Figure 2.**

The entry-fabric switch option enables connectivity with one other switch in a maximum two switch configuration, while the full fabric option enables much wider connectivity for larger SAN environments.



# SILKWORM 3200

## SILKWORM 3200 SPECIFICATIONS AT A GLANCE

### Systems Architecture

Fibre Channel ports	8 (all universal ports or any 2-switch configuration)		
Scalability	2-switch fabric to a full-fabric architecture with 239 switches maximum		
Certified maximum	32 switches, 7 hops with optional full-fabric license; larger fabrics certified as required		
Interoperability	Any SilkWorm 1000 series, 2000 series, 3000 series, or later switch		
Performance	2.125 Gbit/sec line speed, full duplex		
Aggregate bandwidth	32 Gbit/sec end-to-end		
Fabric latency	<2 μ sec. with no contention, cut-through routing		
Maximum frame size	2112-byte payload		
Classes of service	Class 2, Class 3, Class F (inter-switch frames)		
Port types	FL_Port, F_Port, and E_Port; self-discovery based on switch type (U_Port)		
Data traffic types	Fabric switches support unicast, multicast (256 groups), and broadcast		
Media types	Hot-pluggable, industry-standard Small Form-Factor Pluggable (SFP), LC connector; Short-Wavelength Laser (SWL); Long-Wavelength Laser (LWL); Extended Long-Wavelength Laser (ELWL); distance depends on fiber optic cable and port speed		
Laser			
Port speed	Cable	Short wavelength	Long wavelength
1 Gbit/sec	50u	500 m (1,640 ft)	N/A
1 Gbit/sec	62.5u	300 m (984 ft)	N/A
1 Gbit/sec	9u	N/A	10 km (6.2 miles)
2 Gbit/sec	50u	300 m (984 ft)	N/A
2 Gbit/sec	62.5u	150 m (492 ft)	N/A
2 Gbit/sec	9u	N/A	10 km (6.2 miles)
Fabric services	Simple Name Server, Registered State Change Notification (RSCN), Alias Server (multicast), Translative Mode, WEB TOOLS, Advanced Zoning (optional), QuickLoop (optional), Fabric Watch (optional), Extended Fabrics (optional), Advanced Performance Monitoring (optional), ISL Trunking (optional), and Remote Switch (optional)		

### Management

<b>Supported software</b>	Telnet, SNMP, Fabric Access API, WEB TOOLS, Fabric Watch (optional), Fabric Manager (optional)
<b>Management access</b>	10/100 Ethernet (RJ-45), serial port
<b>Diagnostics</b>	POST and embedded online/offline diagnostics

### Mechanical Specifications

<b>Enclosure</b>	Back-to-front airflow, power and cable on the same side, 1U, 19-in.-EIA compliant
<b>Dimensions</b>	Depth: 10.4 in (26.4 cm) Height: 1.7 in (4.2 cm) Width: 16.9 in (42.8 cm)
<b>Weight</b>	3.9 kg (8.5 lbs)
<b>Environment</b>	
<b>Temperature</b>	Operating: 10° C to 40° C (50° F to 104° F) Nonoperating: -25° C to 70° C (-13° F to 158° F) at 90% relative humidity
<b>Humidity</b>	20% to 85% noncondensing at 40° C (104° F)
<b>Altitude</b>	Up to 3,000 m (9,800 ft)
<b>Vibration</b>	Operating: 0.5 Gs, 5-500-5 Hz Nonoperating: 2.0 Gs, 5-500-5 Hz
<b>Shock</b>	Operating: 150 Gs, 2.7 ms half-sine Nonoperating: 60 Gs, 13 ms trapezoid

### Power Specifications

<b>Supported power</b>	Nominal: 100 to 240 VAC contiguous
<b>Range</b>	Operational: 90 VAC to 264 VAC
<b>Frequency</b>	47 to 63 Hz
<b>Power consumption</b>	50 Watts (maximum)

### Regulatory Compliance

	<b>Safety</b>	<b>EMC</b>
<b>Canada</b>	CSA 60950	ICES-003 Class A
<b>United States</b>	UL 60950	FCC Part 15 Class A
<b>Japan</b>	IEC60950 A4	VCCI Class A
<b>European Community</b>	EN60950 TUV, NEMKO	EN55022 Level A EN55024 (Immunity)
<b>Australia/New Zealand</b>	—	AS/NZS 3548
<b>International</b>	IEC 60950	CISPR 22

### Fibre Channel Standards and Revisions

FC-AL-2 Rev 7.0, FC-FLA Rev 2.7, FC-GS-3 Rev 7.01, FC-FG Rev 3.5, FC-FS Rev 1.7, FC-PH Rev 4.3, FC-PH-2 Rev 7.4, FC-PH-3 Rev 9.4, FC-PLDA Rev 2.1, FC-SW-2 Rev 5.4, FC-VI Rev 1.6, IPFC RFC 2625



#### Corporate Headquarters

San Jose, CA USA  
T: (408) 333-8000  
info@brocade.com

#### European Headquarters

Geneva, Switzerland  
T: +41 22 799 56 40  
europe-info@brocade.com

#### Asia Pacific Headquarters

Tokyo, Japan  
T: +81-3-5402-5300  
apac-info@brocade.com

#### Latin America Headquarters

Miami, FL USA  
(T): 305-716-4165  
latinam-sales@brocade.com

© 2003 Brocade Communications Systems, Inc. All Rights Reserved. 08/03 GA-DS-241-03

Brocade, the Brocade B weave logo, Secure Fabric OS, and SilkWorm are registered trademarks of Brocade Communications Systems, Inc., in the United States and/or in other countries. FICON is a registered trademark of IBM Corporation in the U.S. and other countries. All other brands, products, or service names are or may be trademarks or service marks of, and are used to identify, products or services of their respective owners.

Notice: This document is for informational purposes only and does not set forth any warranty, expressed or implied, concerning any equipment, equipment feature, or service offered or to be offered by Brocade. Brocade reserves the right to make changes to this document at any time, without notice, and assumes no responsibility for its use. This informational document describes features that may not be currently available. Contact a Brocade sales office for information on feature and product availability. Export of technical data contained in this document may require an export license from the United States government.